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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/862,458	05/23/2001	Masahiko Tanaka	001425-104	7476

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BUCHANAN, INGERSOLL & ROONEY PC
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EXAMINER	
MOORE, KARLA A	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/862,458	TANAKA ET AL.	
	Examiner	Art Unit	
	Karla Moore	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,9-26 and 28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,9-11,14-17,20-24,26 and 28* is/are rejected.

7)☒ Claim(s) *2-3,6,12-13,18-19,25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4, 9, 14-15, 20-24, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No. 11-168094A to Yuda in view of U.S. Patent No. 6,086,677 to Umotoy et al. and U.S. Patent No. 5,102,523 to Beisswenger et al.

3. Yuda et al. disclose the invention substantially as claimed in Figure 1 and comprising: a vacuum reaction chamber (Figure 1, 16) and a electrically conducting dividing plate/dividing means (Figures 8-10, 26; paragraph 43 of JPO online translation), the vacuum reaction chamber is divided into a plasma discharge space (Figure 8, above the plate) and a film deposition process space (Figure 8, below the plate), the dividing plate having a plurality of internal spaces (27) and a plurality of holes (30) therein, the internal spaces are connected with the film deposition process space, the plurality of holes connect the plasma discharge space with the film deposition process space, and a plasma is used to generate radicals in the plasma discharge space, which radicals are introduced into the said film deposition process space through the plurality of holes in the dividing plate, and a precursor gas (9) is directly introduced into the film deposition process space form the internal spaces, whereby the radicals and precursor gas introduced into the film deposition process space react together to deposit a film (4) on a substrate (3) disposed in the film deposition process space, the dividing plate is constructed so as to separate the radicals generated in the plasma discharge space from the precursor gas while the precursor gas is in the internal spaces.

4. However, Yuda et al. fail to teach the dividing plate is made of a plurality of plates connected together by securely bonding them over substantially an entire area of their interfacial surfaces.

5. Umotoy et al. teach using a plurality of plates as a way to maintain gases in separate passages of

a distribution plate until they exit the distribution plate into the process region (column 1, row 64 through column 2, row 5). Umotoy et al. further teach fusing together a plurality of laminated plates at their contacting surfaces for the purpose of avoiding the use of o-rings while maintaining separation of gases as gases transition from the upper plate to the lower plate (column 3, rows 33-44 and column 5, rows 5-15). Also see column 7, rows 40-47.

6. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plurality of laminated plates fused together at their contacting surfaces in Yuda et al. in order to maintain gases in separate passageways until they exit the distribution plate into the process region and in order to avoid the use of o-rings while maintaining a separation of gases as the gases transition form an upper plate to a lower plate as taught by Umotoy et al.

7. Yuda et al. and Umotoy et al. disclose the invention substantially as claimed and described above.

8. However, Yuda et al. and Umotoy et al. fail to teach the dividing plate is arranged in the vacuum reaction chamber such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes.

9. Beisswenger et al. teach a dividing plate and accompanying seals (Figure 1, 65 and 66) to seal the dividing plate and adjacent spaces within a vacuum chamber for the purpose of preventing gases from escaping upwards (column 4, rows 57-62).

10. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided seals for arranging the dividing plate such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes in Yuda et al. and Umotoy et al. in order to prevent gases from escaping upwards as taught by Beisswenger et al.

12. Yuda et al., Umotoy et al. and Beisswenger et al. disclose the invention substantially as claimed and as described above.

13. However, as described above Yuda et al., Umotoy et al. and Beisswenger et al. fail to teach a

plurality of holes formed to satisfy the condition uL/D>1, where u is the gas flow rate inside the holes, L is the effective length of the holes and D is the diffusion coefficient.

14. Umotoy et al. do however teach that the choice of hole size for each gas is purely a process condition and as such, hole size will depend on gas flow rate, gas pressure, gas type, chamber pressure and the like (column 5, rows 37-43).

15. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to find an optimum gas hole configuration in Yuda et al., Umotoy et al. and Beisswenger et al. based on conditions of each individual process as taught by Umotoy et al.

16. Further, the courts have ruled where the general conditions of a claim are disclosed by the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 2235 (CCPA 1955).

17. With respect to claims 4, 14, 20, 22-23 and 26, as noted above, the dividing plate is made by connecting together a plurality of laminated plates by securely bonding them ever the entire area of their interfacial surfaces (this includes the outer periphery and portions that are within the outer periphery, as recited in claim 9). Additionally, the plurality of holes provided in the dividing plate is formed by piercing through it at positions where the internal spaces are not disposed (i.e. they do not overlap).

18. With respect to claims 9, 15, 21, 24, Yuda et al. teach that the dividing plate is an electrode, so it would inherently be made of electrically conductive material.

19. With respect to claim 28, as noted above, the dividing plate of Yuda et al. comprises a plurality of internal spaces.

20. Claims 10-11 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuda et al., Umotoy et al. and Beisswenger et al. as applied to claims 1, 4, 9, 14-15, 20-24, 26 and 28 above, and further in view of U.S. Patent No. 5,433,786 to Hu et al.

21. Yuda et al., Umotoy et al. and Beisswenger et al. disclose the invention substantially as claimed

and as described above.

21. However, Yuda et al., Umotoy et al. and Beisswenger et al. fail to teach the plurality of plates bonded together by a plurality of rivets or threaded fasteners.

22. Hu et al. teach the use of rivets and other suitable fastening means for the purpose of assembling an electrode (column 3, rows 53-56).

23. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided rivets or other suitable fastening means in Yuda et al., Umotoy et al. and Beisswenger et al. in order to assemble the dividing plate/electrode as taught by Hu et al. Further, the courts have ruled that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

Allowable Subject Matter

24. Claims 2 and 6 are allowed.

25. The following is an examiner's statement of reasons for allowance: The prior art presented above fails to teach or fairly suggest a plurality of metal fixings (either rivets or threaded parts) to securely bond the laminated plates over the entire area of their interfacial surfaces, and the plurality of holes provided in the dividing plate are provided through the metal fixings. Additionally, no other prior art reference provides motivation for the feature.

26. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

27. Claims 3, 7, 12-13, 18-19 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

28. The prior art presented above fails to teach or fairly suggest a plurality of metal fixings (either rivets or threaded parts) to securely bond the laminated plates over the entire area of their interfacial surfaces, and the plurality of holes provided in the dividing plate are provided through the metal fixings.

As noted above, no other prior art reference provides motivation for the feature.

Response to Arguments

34. Applicant's arguments presented in submissions filed on 25 May 2006 with respect to claims 1, 4, 9-11, 14-17, 20-24, 26 and 28 have been considered but they are not convincing.

36. Perceived Error No. 1: Communication between the plasma discharge space and the film deposition process space. Beisswenger teaches using sealing means to prevent the upwards migration of gases. One would be motivated to combine the aforementioned feature with the disclosure of Yuda as the apparatus of Yuda is designed so that gases travel in a downwards direction and are then used on a processing surface of the substrate. Gases flowing the opposite direction would be counterproductive. Further, if two spaces are sealed from one another any existing pressure differential will be maintained. It is not necessary that the prior art teaches the desirability of maintaining a pressure differential. What is required is that an apparatus capable of maintaining a pressure differential is disclosed, which is the case. With respect to the confusion of whether or not Yuda alone or Yuda in combination with Beisswenger discloses a dividing plate arranged in a vacuum region such that the only communication between the plasma discharge space and the film deposition space is through the plurality of holes, Examiner notes that it is very clear throughout the office action that the rejections are based on the combination of the references. Admittedly, while the invention of Yuda only positively discloses that the two spaces communicate through the holes the references, the reference does not explicitly teach that there is no other way for communication between the two spaces. This is why Beisswenger is relied upon for additional teachings and this is made very clear in the action. The use of the word "only" in response to Applicant's arguments was inadvertent. Examiner notes that the rejections of the claims are in no way based on this interpretation and that there really is no basis for relying on such an interpretation, absent the single word pointed out.

35. Perceived Error #2: Motivation to combine Umotoy with Yuda. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the

references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Umotoy teaches the use of a plurality of plates as a gas supply mechanism for the purpose maintaining gases in separate passageways of a distribution plate until they exit a distribution plate into the process region. Yuda is also concerned with maintaining a separation between gases being supplied through a multi-plate supply arrangement. One of ordinary skill in the art would look to a reference would look to a reference such as Umotoy based on the fact that they are concerned with same issue. Examiner points out that a reference does not have to positively recite a problem in order for it to be obvious to one of ordinary skill in the art to look to another reference for structural improvements.

36. Perceived Error #3: Purpose of Holes. As pointed out previously, optimization of hole size is something that is taught in the prior art and would be related to the processing parameters/conditions associated with an intended method.

37. Perceived Error #4: Motivation to combine all three references is lacking. Motivation for combination of the relied upon references has been discussed previously and is described in paragraphs 5-6, 9-10 and 22-23, for example, in the above rejection. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

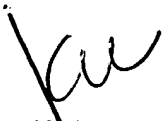
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH

shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore
Primary Examiner
Art Unit 1763
27 July 2006